

dor is a very large tank (24), containing a large number of freshwater fish given by Mr. T. R. Sachs, of the Thames Angling Preservation Society. In tank 25 are Sea Perch; and in tank 27, which occupies the entire side of corridor No. 3, being no less than 63 feet in length by 14 feet in width, with seven feet of water, are a large number of full-sized dog-fish, a perfect shoal of large cod, and a Monk Fish more than five feet in length.

The aquarium in this direction is capable of almost indefinite extension, should the present success of the Company be maintained.

The sea-water for the aquarium is obtained from the Baths Company, who draw their supply from a point in the channel near the end of the pier, which is more than 1,400 yards in length. The water is received in a large storage tank under the conservatory, from which it travels through the various tanks, returning to a lower storage reservoir, from which it can be pumped back into the upper one, not less than 150,000 gallons of water being in constant circulation. As at Berlin and Brighton, compressed air is forced into the tanks, through india-rubber pipes; and Mr. Lloyd's plan of putting oysters into the tanks, introduced at Brighton, is adopted. The tanks, as well as the rest of the building, including the conservatory, are lighted at night by gas.

In the existence of large aquariums at Southport and Brighton, the ideas so long advocated by Messrs. Carl Vogt, Milne-Edwards, and Dr. Anton Dohrn, for the establishment of zoological stations, have to a certain extent been realised in England; but before they can be made available for original observation and research, laboratories must be built, and depot stations established at a few points on the coasts of Ireland and Scotland. Moreover, other large expenditures of an eminently uncommercial character must be incurred, which will never be entertained by commercial companies; but these, on the other hand, would probably not object to afford facilities for study if the necessary funds were found by those colleges, universities, and learned societies that prosecute the study of biological science.

CHARLES E. DE RANCE

#### NOTES

THE Eclipse Expedition arrived safely at Point de Galle on March 15. The Indian observing party proceeds to Nicobar Island by the *Enterprise*, which left Calcutta on the 11th inst.

As we have already intimated, the Faraday Lecture of the Chemical Society will be given to-night in the Theatre of the Royal Institution by Dr. Hofmann, of Berlin, on "Liebig's Contributions to Experimental Chemistry."

THE service of meteorological telegrams to the ports of France was resumed on the 1st inst. The arrangements now in operation are as follows:—A large placard is sent down to be posted up in some public place, containing two specimen daily charts of the weather, and some simple rules for interpreting them. There are three blank spaces at the foot of the placard, which are intended for the chart of the preceding day from the *Bulletin International*, which arrives by post, and for two forecasts, morning and evening, which are to be transmitted by telegraph daily. It does not appear that there is to be any provision for exhibiting signals for the purpose of giving warning of storms. At present the only such signals which are apparently in use on the French coasts are those hoisted by the authorities of the Marine Ministry, from Dunkirk to Nantes, on the receipt of warning telegrams from London, and those hoisted south of Nantes, on the coast of the Bay of Biscay, on the receipt of orders from the Préfet Maritime of Rochefort.

THE French Telegraphic Administration has appointed two delegates to examine, in common with the Board of the Observatory, what steps should be taken to collect by wire meteor-

ological information, in order to send warnings to agricultural districts. The organisation of agricultural warnings will be one of the principal subjects of discussion at the forthcoming Paris Meteorological Congress.

M. MOUCHEZ, the chief of the St. Paul French Transit party, gave before the Academy of Sciences of Paris, at its sitting of the 15th inst., the first part of his report. M. Velin, the naturalist of the expedition, brought with him to Paris three living and a number of preserved specimens of all the species of the existing fauna, which is almost entirely marine. No landing could be effected on Amsterdam Island. Saint Paul and Amsterdam cannot be regarded as the remains of a shattered continent, but from their appearance and geological connection must have been elevated from the bottom of the ocean by individual volcanic eruptions.

WE learn from the *Saar und Mosel Zeitung* that we are liable to the importation not only of potato-beetles and Phylloxera, but even shells. About fifteen years ago some small shells were discovered in the Moselle near Treves, which were very different in form from the other native species. A few weeks back the discovery was made that the same locality now abounds in this new animal, as large numbers were found in a perfectly developed state. This seems to prove that the little ones, that were doubtless imported by some raft, have grown and propagated. It is stated that the real home of this species is the Sea of Azoff and the Black Sea, and it is remarkable that they inhabit both salt and fresh water.

THE *Kölnische Zeitung* reports that besides Phylloxera and the Colorado Beetle a third noxious insect has come over to Europe from America; it is the so-called Blood Louse, which causes much damage to apple-trees. As a practical remedy against this unwelcome guest, it is recommended to paint the young trees with naphtha and lime-water. With larger trees of course this is impossible; but it is said that if during winter a thin lime paste is placed in a circle round the tree where it comes out of the ground, the ova of the Blood Louse are then completely destroyed.

THE discovery is announced at the Pola Marine Observatory of Planet 143, by Director J. Palisa, with a telescope of  $7\frac{1}{2}$  ft. focal length. It appeared of the 12th magnitude, and the ephemerides given are: 1875, Feb. 23, 8h. 42m. 12s. Pola mean time; R.A., 9h. 57m. 57s. (daily motion - 60s.); and Decl. + 13° 46' (daily motion + 1'). Of the 143 asteroids, 97 have been discovered in Europe, 41 in America, and 5 in Asia.

THE celebrated physicist Amberg lately delivered three lectures at the "Volksbildungsverein" at Cologne, principally on the phenomena of Electricity, Optics, and Acoustics.

THERE will be an election at Magdalen College, Oxford, in June next, to at least one Demyship and to one Exhibition in Natural Science. The stipend of the Demyship is 95/- per annum, and of the Exhibition 75/-, inclusive of all allowances, and they are tenable for five years. Particulars may be obtained by applying to the senior tutor.

THE Council of the Senate of Cambridge University propose to offer a grace early next term for the appointment of a syndicate to consider the propriety of establishing a professorship of Mechanism and Engineering.

AMONG the papers appointed by the Council of the Institution of Naval Architects to be read at the meetings on the 18th, 19th, and 20th inst., are the following:—On the Telegraph ship *Faraday*, by W. C. Merrifield, F.R.S.; On a mode of obtaining the outlines of sea-waves in deep water, by W. W. Rundell; On the graphic integration of the equation of a ship's rolling, including the effect of resistance, by W. Froude, F.R.S., vice-president; On a method of obtaining motive

power from wave motion, by B. Tower; Notes on polar diagrams of stability, &c., by John McFarlane Gray; On compound engines, by R. Sennett; On the Bessemer steamship, by F. J. Reed, C.B., M.P., vice-president.

M. WALLON, the new French Minister of Public Instruction, is an old University man; he was for years Professor of History in the Normal School. His appointment has given great satisfaction to the French *savants*, and the reception which he had on his installation on the 13th inst. was something more than a formal congratulation.

AN interesting study has lately been made by Prof. Holden, of the Washington Observatory, on the observations of Sir William Herschel upon the satellites of Uranus. It is well known that the latter astronomer sixty years ago announced that Uranus was accompanied by six satellites; but of the existence of four of these there has always been considerable doubt, since no one was ever able to confirm the observations of Herschel. In 1847 Lassell discovered two interior satellites, which were, however, different from those which Herschel suspected; and since that day the four problematical satellites of Herschel have been generally discarded by astronomers. Prof. Holden now brings testimony to the high excellence of Herschel's observations, as, by computing backward, he has shown that probably this distinguished astronomer actually observed the two interior satellites of Lassell (named by him Ariel and Umbriel); but that he was unfortunately prevented from identifying them as satellites because his telescope could not show them on two successive nights. The extreme difficulty of observing these objects makes us wonder at the marvellous skill and patience manifested by the elder Herschel in this laborious research, which was carried on by him from 1787 to 1810.

THE Imperial Astronomical Observatory of Brazil is a dependence of the Central College of Rio Janeiro, and is destined not only to teach practical astronomy to the students, but to make and publish astronomical and meteorological observations. The chronometers of the navy and army are there regulated, and the time is given daily by signal to the city. The building is situated on an eminence within the city, and the Government is now taking measures to improve its scientific character. The director is at present in Europe with a view of procuring such instruments and apparatus as may be adapted to the studies required of the institution. An entire reorganisation of the Observatory is under way, with the purpose of training more thoroughly the persons charged with geologic and geodetic works. There is also an observatory at the capital of the province of Pernambuco.

WE have received the Catalogue of the Library of the Manchester Geological Society, compiled by Mr. John Plant, F.G.S. We are glad to see that the members of this Society possess so good a collection of works connected with the various departments of geology, and we hope a large proportion of them take advantage of the privilege. Mr. Plant has arranged the books in eleven divisions, which will no doubt facilitate the work of reference, though it seems to us that divisions for works in German, works in French, &c., are unnecessary.

MR. HENRY CHICHESTER HART, B.A., one of the naturalists appointed to the Arctic Expedition of 1875, has published an enumeration of all the flowering plants and ferns known to occur in the Arran Islands, Galway Bay. The flora of the whole of the west of Ireland is extremely interesting on account of the south-west European types it includes, indicating the possible former existence of a connection between the British Islands and the Continent. The Arran Isles flora includes no endemic species, and, on account of their peculiar geological formation, the numbers of species is scarcely so large as might otherwise have

been expected. The formation belongs to the Upper Carboniferous Limestone, and consists of deeply-fissured platforms or terraces, paved with large flags. Mr. Hart's list contains 372 species, including *Dabeocia polifolia* and some other West European forms. *Ajuga pyramidalis* and *Helianthemum canum* are at home here, and *Gentiana verna* is reported to be one of the commonest weeds. One of the principal features of the flora is the luxuriance of the ferns in the deep fissures of the rocks. The true maiden-hair (*Adiantum capillus-veneris*) is said to be common on all three islands, and often found with fronds two feet long. In the same situations the fronds of *Asplenium marinum* attain a length of three feet, and those of *Ceterach officinarum* a foot or more. Mr. Hart himself adds about twenty-five undoubtedly indigenous species to those previously known.

WITH regard to the conservancy and working of the East Indian rubber-trees (*Ficus elastica*), the yield of which forms one of the most important products of the Assam forests, we learn that there have been three proposals made to Government: the first is that Government should annually sell the right to collect the rubber; the second, that the rubber should all be purchased by Government; and the third, that Government officers should manage the forests. In opposition to this, however, it is said that much of the rubber is brought in from forests by wild and half-subjugated tribes, and still more by tribes that are under no subjection at all; so that conservancy is impossible, and a Government monopoly very difficult. Only two courses seem possible: either to allow speculators to make their own bargains with the hill men as they liked, or to enforce an effective Government control. Sir George Campbell considers the latter course to be the right one. The exports of caoutchouc, it appears, which amounted to 21,000 maunds in 1871-72, fell in 1872-73 to 11,000, this decrease being attributed to the closing of the Luckimpur forests with a view to preventing frontier complications.

THE quantity of sandal-wood sold in the provinces of Mysore and Curg during the year 1872-73 was 889 tons, valued at 27,896/-.

THE growth of beet-root in Belgium for the manufacture of sugar appears to be falling off, owing to its prohibition by land-owners and the unwillingness of the farmers to cultivate it in consequence of its exhaustive nature, a crop of beet impoverishing the soil considerably. It is said, however, that if the farmers could act independently, considerable quantities of beet would be grown, for not only would it then be advantageous to them in a pecuniary point of view, but it would furnish them with a new and valuable food for the use of their cattle and horses. In France, on the other hand, the cultivation of beet is being extended, the pulp, after the extraction of the sugar, proving very serviceable for fattening cattle.

DR. R. A. PRYOR intends publishing a new "Flora" of Herefordshire, and to enable him to make it as complete as possible, he has issued a circular containing lists of plants respecting which further information is needed. Critical species will be thoroughly studied out. Webb and Coleman's "Flora Hertfordiensis" (1849), supplements to which appeared in 1851 and 1859, is a very good work, and the only "Flora" of the county hitherto published; but so much has been done in critical botany of late that it is, in this respect, out of date.

ON Friday the 12th inst. an icy cloud passing before the sun exhibited the laws of the formation of halos with an extraordinary precision. The cloud, driven by an upper wind, was travelling at a slow rate from south to north. A partial halo was first seen on the northern edge, developed itself, lasted as long as the cloud, occupied more than  $16\frac{1}{2}$ ° north and  $16\frac{1}{2}$ ° south

of the sun, and diminished gradually until it disappeared on the southern edge of the cloud. It was, when complete, a perfect circle of white light, with the centre quite black, but not thick enough to prevent the sun being seen. The phenomenon lasted from 11:39 to 12:15, and was noticed at the Paris Observatory.

AMERICAN papers state that an earthquake at Guadalajara, Mexico, on the 11th of February, damaged houses and churches. The Seboruco volcano at the same time was in a violent state of eruption. The shocks extended to San Cristabal, where houses were destroyed, and several persons were killed.

FOR the protection of vineyards against frost in spring, the production of large artificial clouds of smoke is a common appliance in France and Germany. We now hear of a new method in this operation, recommended by M. G. Vinard. It is easily executed, and has proved successful; it consists in carefully mixing gas-tar with sawdust and old straw, and piling up this mixture into large heaps in the vineyards. The mixture remains easily inflammable, in spite of rain and weather, for more than a fortnight. When required for use, smaller heaps are made from the large ones, of about two feet in diameter, and are distributed in and round the vineyard. If there is little wind these heaps burn freely for about three-and-a-half hours, and produce a very dense smoke. The artificial cloud which thus enwraps the vines considerably decreases the radiation from the ground, and with it counteracts frost, which is greatest towards morning during calm spring nights, and which does so much harm to the plants.

IT is proposed—in fact steps have been taken—to acclimatise the Florida Cedar in Bavaria. The superiority of the wood of this tree (*Juniperus Virginiana*) over all other kinds of cedar, is well known, and the demand for the wood in Bavaria, where immense quantities of lead-pencils are made, has induced some manufacturers to take up the question of the acclimatisation of the tree in that country. Seeds have been sown in the Royal Forest, and about 5,000 young plants have been grown on one private estate: the cultivation of the tree is also being attempted in other parts of Germany.

IN a farm in the State of Nevada (U.S.), near the River Larson, there is a troop of twenty-six camels, all of which, with the exception of two, have been reared there. A few years ago nine or ten of these animals were imported into America, but only two survived; and these two, being fortunately a male and female, have produced twenty-four, all of which are now alive. The soil is sandy and sterile in the extreme, and the animals thrive well, although their only food consists of the prickly leaves of a small shrub, and bitter herbs which cattle will not touch. They are employed to carry merchandise, and perform considerable journeys across a very barren country.

A RECENT number of the *Courrier de Jonzac* reports that a meteorite was seen falling on a field in the Island of Oleron, and is believed to be a part of the meteor which was seen at so many places on the 10th of February last. The circumstances of the fall will be investigated carefully.

A METEOR was not only seen but actually caught at Orleans on the 9th inst. A small mass of pyritous substance was discovered in one of the streets, at the very place which had been struck by an immense flame a few seconds before. The pieces were divided among bystanders anxious to secure the possession of the smallest fragment of such a celestial object; but it is hoped some of the possessors will be intelligent enough to get a specimen sent to the Academy of Sciences.

ASTRONOMICAL and meteorological subjects are beginning to interest the French public. Two of the most influential Parisian papers, the *Temps* and the *Siecle*, publish daily, with comments, the weather forecasts of the Observatory.

WE may expect soon to see every large town in the kingdom in possession of an aquarium. A very fine one has quite recently been completed at Southport, a description of which we are able to give in to-day's NATURE; the foundation-stone of the Westminster establishment will be laid in a week or two; a scheme for the construction of an aquarium at Plymouth is maturing; an aquarium and winter garden is talked of at Edinburgh; a bill is before Parliament for the purchase of a site at Scarborough for an aquarium; and we have every reason to hope that Birmingham will soon be able to count one among its many other educational institutions. In a recent lecture at the last-mentioned town by Mr. W. R. Hughes, F. L. S., on Aquaria, the lecturer pointed out very forcibly how valuable such institutions might be made as a means of education. That gentleman deserves great credit for the trouble he has taken to obtain full information concerning the history and management of aquaria, and under his guidance we should think an aquarium at Birmingham ought to be second to none in the kingdom.

WE are glad to see from several numbers of the *Huddersfield Chronicle* which have been sent us, that the Huddersfield Naturalists' Society is in a healthy working condition. The members are evidently successfully investigating the natural history of their district, and from the reports of papers read and the discussions thereon, we judge that a considerable proportion of the members take a share in the business of the Society.

THE additions to the Zoological Society's Gardens during the past week include two Vervet Monkeys (*Cercopithecus lalandii*) from South Africa, presented by Mrs. A. Thorlley; a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. H. Edwards; a Chimpanzee (*Troglodytes niger*) from West Africa; two Indian Muntjacs (*Cervulus muntjac*) from India, deposited; a Yellow-bellied Liothrix (*Liothrix lutea*) from India, purchased; two Hairy Armadillos (*Dasyurus villosus*), born in the Gardens.

#### SCIENTIFIC REPORT OF THE AUSTRO-HUNGARIAN NORTH POLAR EXPEDITION OF 1872-74 \*

##### II.

MAGNETIC disturbances are closely connected with the Aurora; while in temperate zones they are the exception, they form the rule in Arctic regions, at least the instruments are almost in constant action. This is the case for the inclination, declination, and intensity needles. As long as the vessel was drifting, i.e. until October 1873, the fixed variation instruments could not be used; absolute determinations with Lamont's magnetic theodolite were made, and several "magnetic journals" (only declination-readings) were kept, but already when near Nowaja Semja, Lieut. Weyprecht found out that on account of the constant disturbances these readings were of very little value, as they could not be compared with simultaneous readings of the variation-instruments. In November, as soon as it was ascertained that the ice-field which enclosed the ship had come to a standstill, Lieut. Weyprecht had snow-huts constructed in which he fixed the variation-instruments, the magnetic theodolite, the inclinometer for the absolute determinations, and the astronomical instruments. The three variation-instruments for declination, horizontal intensity, and inclination had been furnished to the expedition by Prof. Lamont, director of the Munich Observatory.

After one day's work it was found already that the former methods of observation, i.e. simple readings at certain hours, are of no value whatever in Arctic regions, as they represent solely the accidental magnitude of the momentary disturbance. These neither give any true mean result, nor do they correctly represent the action of the needles. All intervals, which were observed for such readings at former expeditions, are absolutely useless, lying far too widely apart to permit of correct conclu-

\* Die 2. Oesterr.-Ungarische Nord Polar Expedition, unter Weyprecht und Payer, 1872-74. (Petermann's Geogr. Mittheilungen, 1875; heft ii.) (Continued from p. 368.)